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A. D. MELVIN, Chief of Bureau.

SANITARY RELATIONS OF THE MILK SUPPLY.

[Report of the committee on sanitary relations to a conference appointed by the Commissioners of the District of Columbia to consider and report upon the local milk supply.]

INTRODUCTORY NOTE.

The Commissioners of the District of Columbia have appointed a committee or conference composed of scientists, physicians, veterinarians, milk producers and dealers, attorneys, and business men to consider and report upon the local milk supply, to advise what steps should be taken to improve it, and to suggest legislation to that end. Several subcommittees have been appointed to investigate and report upon various phases of the subject. A report by the committee on sanitary relations of the milk supply, in the nature of a reply to certain objections and criticisms brought against recommendations previously made by the committee, is herewith presented in the form of a circular of the Bureau of Animal Industry, as the subject is one of great interest and importance to the public not only in the city of Washington, but in many other cities and sections of the country where similar problems exist.

The personnel of the subcommittee making this report is as follows: Dr. George M. Kober, Professor of Hygiene, Medical Department, Georgetown University, chairman; Mr. Emile Berliner; Dr. G. Lloyd Magruder; Dr. Charles F. Mason, Assistant Surgeon-General, United States Army; Dr. A. D. Melvin, Chief of the Bureau of Animal Industry, United States Department of Agriculture; Dr. John R. Mohler, Chief of the Pathological Division of that Bureau; Mr. Ed. H. Webster, Chief of the Dairy Division of the same Bureau; Dr. M. J. Rosenau, Director of the Hygienic Laboratory, Bureau of Public Health and Marine-Hospital Service; and Col. Robert G. Smith, milk producer.

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Chief of Bureau.

OPPOSITION OF THE MILK INDUSTRY TO REASONABLE REQUIREMENTS.

It is a remarkable fact that every attempt to improve the purity of this invaluable article of food should be promptly opposed by the milk industry, which constitutes a strong spoke in the commercial wheel and evidently considers it meddlesome interference with the trade. The men engaged in this industry evidently do not know, and can not know, that such hydra-headed diseases as cholera infantum, scarlet fever, and diphtheria have been disseminated in the milk supply, that typhoid-fever epidemics have been thus caused, and that milk may be the vehicle of the germs of tuberculosis and other infectious diseases and morbific agents.

Pure, natural milk can only be secured at dairies with sanitary buildings, a pure water supply, healthy, well-fed, and well-cared-for cows, a well equipped and well-kept milk room, provisions for thorough cleanliness, intelligent and conscientious people in charge, and clean methods throughout. There are a number of persons, thanks to the training received at the dairy schools, who make an honest effort to place on the market milk obtained under such conditions, but by far the majority of milk producers are indifferent to hygienic requirements and would prefer the good old days when there was no control even to prevent the shameful adulterations of milk by the intentional dilution with water, the removal of some of its cream, or the addition of skimmed milk—practices which, alas, still exist.

Dr. H. W. Wiley, Chief of the Bureau of Chemistry, United States Department of Agriculture, reports that during the last few months his Bureau examined 327 samples of milk bought in Washington, of which 56, or a little over 17 per cent, had been skimmed or watered; and of 96 samples of cream, 38, or 39.95 per cent, were below the standard required by law.

The records of the Health Department of the District of Columbia show that during the past five years 28,859 samples of milk were examined, and that of these 6,801, or 23.5 per cent, were below the fixed standard, and in 1,305 instances prosecutions for the sale of adulterated milk were presented in the courts.

These robberies, largely made up of the pennies of the poor and sickly women and half-starved children, amount in money value to considerably more each year than the entire cost of the Health Department.

Matters of this kind should not be left, therefore, to the individual dealers, but the principles which ought to be carried out should be embodied in effective laws and accepted and enforced in a practical sense.

Honorable men will not object to regulations calculated to promote the purity of their product and the health of their customers, and as many of the most serious faults in the milk business are the result of ignorance rather than of intentional neglect, the difficulties will be materially lessened by proper education and trade competition. At all events the dairyman will conclude in the end that it is money in his pocket to comply with requirements which at present may appear to him the outcome of exaggerated fear or extreme sanitary zeal of theorists.

So, for example, frequent inspections of the dairy stock will be a source of ultimate profit to the owner, as the presence of tuberculosis or any other communicable disease endangers his entire herd, and great losses can be prevented by the prompt isolation or extermination of the first cases. The farmer will likewise find that if he houses his cattle in

spacious, well-lighted, and well-ventilated stables, or even in properly constructed sheds, there will be less tuberculosis and sickness among the herds. Indeed, every recommendation so far submitted by the committee is not only in the interest of the public health, but also of benefit to the farmer, and if the production of a clean, wholesome milk involves increased cost, the committee is on record to the effect that the additional expense should be borne by the consumer.

EVIDENCE THAT MILK IS A CAUSE OF DISEASE.

1. It has been shown by the most painstaking investigations, extending over a long period of years, that certain diseases in the animal are communicable through the medium of the milk, this being especially true of tuberculosis, foot-and-mouth disease, anthrax, and cowpox; and that diseases like garget, gastro-enteritis, and septic fevers in the cow will render the milk morbific to man.

2. It has been shown that animals which have fed on poisonous forage plants or have been treated with strong medicaments are disqualified from producing a pure or sound milk.

3. During the past twenty-five years there have been published in the different medical journals the histories of 195 epidemics of typhoid fever, 99 of scarlet fever, and 36 of diphtheria, all traceable to the milk supply.

In the recent exhaustive investigation conducted by the highest health authority in this country, viz, the United States Bureau of Public Health and Marine-Hospital Service, the commission definitely traced 85 of the 866 cases of typhoid fever (about 10 per cent) in the District of Columbia to the use of infected milk.

4. It has been shown in a former report that in the District of Columbia about one-fourth, and in the country at large about one-sixth, of all the children born perish before the completion of the first year; that nearly one-half of the deaths in children under 1 year of age are caused by gastro-enteric diseases, chiefly infantile diarrhea; and that of the 54,047 infantile deaths which have been investigated at home and abroad with reference to feeding, 86.6 per cent had been artificially fed, all of which points with more than mere suspicion to the fact that the morbific agent is introduced into the body with the food (cow's milk).

WASHINGTON MARKET MILK.

The Washington market milk compares favorably with the supply in other cities. There is no evidence to show that it is worse, but there is abundant evidence to indicate that stale and infected market milk is everywhere responsible for a needless sacrifice of human life, and it is clearly the duty of the state to take what precautions it can to prevent sickness and distress. To indicate the value of sanitary control in this city it may be stated that since the enactment of a pure-milk law in 1895

the percentage of deaths in children under 1 year of age to the total deaths of all ages has been reduced from 26.94 to 18.36 in 1905.

TEMPERATURE OF MILK.

The committee on certified milk and the committee on sanitary relations of the milk supply have both emphasized the importance of cooling the milk and keeping it at a temperature below 50° F., except as may be necessary in the process of pasteurization or sterilization, until the milk is delivered to the consumer. The reason for this is that milk when it leaves the udder contains very few germs; the majority gain access during handling, especially when the milking is done in a dusty stable, or from excrementitious matter adhering to the teats and udder of the animal. These germs multiply with astonishing rapidity whenever the temperature of the milk is above 50° F., and if disease germs are present their proliferation augments the chances of infection. A temperature of 58° or 60° F. will not subserve the interests of public health. So, for example, "Petruschky has shown that at a room temperature a streptococcal content of 300 per cubic centimeter may increase in twenty-four hours to one of 10,000,000; but the same milk kept at 50° F. yielded but 30,000, or but three one-thousandths as many." (Harrington.)

Von Freudenreich (Dairy Bacteriology, London, 1895) exposed a sample of milk containing 153,000 bacteria per cubic inch to a temperature of 59° F. One hour after it contained 539,750 bacteria per cubic inch; two hours after, 616,250; four hours after, 680,000; seven hours after, 1,020,000; nine hours after, 2,040,000; twenty-five hours after, 85,000,000. Bryce, of Toronto, has made similar investigations.

The question of germ development and souring of milk is influenced, therefore, largely by the temperature. To reduce the temperature of milk in summer to 50° F. necessitates the use of ice. Some farmers maintain that they have no opportunity for buying or securing ice, and use this as an argument against the provisions of the proposed legislation requiring the cooling of milk. Dr. G. Lloyd Magruder, with commendable zeal and thoroughness, has investigated this question in a perfect spirit of fairness to the producer and shipper, and a letter from Prof. Willis L. Moore, Chief of the United States Weather Bureau, to Doctor Magruder, dated December 29, 1906, shows that for the last thirty years there was but one winter (that of 1899–1890) during which ice could not have been gathered from ponds in the vicinity of Washington.

INCREASED COST SHOULD BE BORNE BY THE CONSUMER.

The use of ice will result in a slight increase in the cost, and your committee is not unmindful of the fact that, while everything else may advance in price without serious remonstrance, loud outcries are made

whenever a progressive dairyman declares that the production of clean, wholesome milk involves an advance of 1 or 2 cents a quart. In the language of Professor Harrington, "the public needs proper education that clean milk is a necessity, and that infant sickness and funerals can be reduced at least 40 per cent. * * * A model farm properly manned certainly can not compete on equal terms with a filthy farm, where no attempt is made to conduct the business in a decent manner, especially if customers are indifferent. The dirty producer can even afford to cut prices and take customers away from the other, if customers care to save a cent and make it up in pus and cow dung."

CERTIFIED MILK.

It was in consequence of a just appreciation of these principles that the so-called "certified milk" came into existence about ten years ago. Responsible bodies of citizens interested in an improved milk supply organized in different cities milk commissions. Such commissions usually select and secure the advice and assistance of four experts—a veterinarian, a physician, a bacteriologist, and a chemist—all more or less familiar with the conditions and possibilities on dairy farms. The commission sends to each dairyman who supplies milk to the city a circular naming all the particular conditions which should be found on every farm where milk is produced for city use, and announcing that where any dairyman notifies the commission that he is fully conforming to the conditions specified, or endeavoring to do so, his dairy will be inspected, and if it is found to comply in letter and spirit to all the requirements his name will be placed upon an approved list and he will receive an official indorsement to the effect that his dairy farm and the herd thereon have been thoroughly examined and found to comply with the conditions recommended by the commission. These conditions include a healthy herd, the use of pure feeds, appropriate stabling and care, pure water, and clean and prompt handling of the milk, which is of good composition and quality and so free from pathogenic and unnecessary bacteria as reasonable safeguards can provide. The attendants are cleanly and free from communicable diseases, and all milk is promptly cooled immediately after milking to a temperature of 50° F. Every intelligent dairy farmer insists upon cooling his milk as soon as the bucket is full.

The inspections are made unannounced and at irregular intervals, so as to insure maintenance of the prescribed standard. Any neglected condition is immediately reported to the commission, which decides whether or not the cause is sufficient to withdraw and cancel the last certificate issued.

Certified milk is reasonably safe, but this is no guaranty that it may not occasionally contain germs of disease, and those who desire to guard against this slight risk should pasteurize it in the home.

PASTEURIZED MILK.

It must be apparent that it will require time and education to secure compliance with even reasonable safeguards, and it is equally evident that the number of dairy farms now in a position to live up to sanitary requirements will supply but a small percentage of the population, although it is hoped that such dairy farms will be stimulated into existence by trade competition and the refusal of the public to buy dirty milk at any price. Until this is accomplished, the committee in the interest of public health strongly advocates clarification and pasteurization of all milk. This, to be sure, will not make bad milk good, but it will at least destroy its power to transmit disease germs.

PASTEURIZING PLANTS OR MILK DEPOTS.

Your committee also believes that this object can be most efficiently and economically secured by the establishment of a pasteurizing plant provided by the District government, or preferably by private enterprise, which plant should be under the supervision of the Health Department.

There is every argument from a commercial and sanitary standpoint in favor of a central plant, erected within reasonable distance from the union depot, where all the milk for the city should be received and prepared for distribution. Such a step would result in the creation of suitable conditions for the proper handling and storage of milk, sterilization of milk cans and utensils; and the efforts of the local milk dealers to provide decent facilities for their 150 or more dairies scattered over the city, all more or less liable to infection, could be concentrated in one plant with a decided saving of expense.

Milk should never be sold by grocery stores or milk shops unless it has been delivered to such establishments in original sealed bottles, and then only when there is provision for maintaining the milk at a temperature of 50° F.

ADVANTAGES AND DISADVANTAGES OF PASTEURIZED MILK.

Your committee is aware that there is a difference of opinion among medical men as to the wholesomeness of pasteurized milk. The advantages and disadvantages have been exhaustively studied by Dr. M. J. Rosenau, Director of the Hygienic Laboratory of the United States Bureau of Public Health and Marine-Hospital Service, and in his opinion the advantages so far outweigh the disadvantages that he "unhesitatingly recommends compulsory pasteurization of all milk not certified under class 1 or class 2 of Doctor Melvin's classification."[1]

[1]The classification referred to is as follows: Class 1, certified milk for infants, as hereinbefore described. Class 2, clean, raw milk from healthy cows, as determined by the tuberculin test and veterinary physical examination; the cows to be housed, fed, and milked under good conditions, but not necessarily equal

IMMEDIATE REMEDIAL ACTION.

Your committee is so strongly impressed with the manifold dangers connected with the milk supply that until the needful reforms in dairy methods are accomplished it recommends to the public the following as immediate safeguards:

1. Do not patronize a milk dealer at any price whose milk after standing for over two hours reveals a visible sediment at the bottom of the bottle. It is evidence of dirty habits, extremely suggestive of danger, and entirely preventable by clean, decent methods without greatly increasing the cost.

2. Subject all your milk to home pasteurization, by simply bringing it to the boiling point, and after cooling keep the milk on ice. This will destroy germ life and reduce the chances of milk-borne diseases to a minimum; and if we can reduce our typhoid-fever rate even only 10 per cent by this simple method, not to mention infantile diarrheas and other infectious diseases, it is clearly our duty to do so.

3. Your committee recommends that the results of the recent investigations into the milk supply conducted by the Bureau of Public Health and Marine-Hospital Service and by the Bureau of Animal Industry and the Bureau of Chemistry of the Department of Agriculture with a view to supplementing the work of the Health Department, which on account of its limited force and laboratory facilities could not possibly conduct such an exhaustive investigation, be placed at the disposal of the Commissioners of the District.

4. In conclusion your committee recommends that until the Health Department shall be in control of a bacteriological laboratory and a sufficient number of inspectors the Health Officer request the continuance of the cooperation of the Bureau of Public Health and Marine-Hospital Service and the Department of Agriculture for improving the local milk supply.

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to the conditions provided for class 1; pure water, as determined by chemical and bacteriological examination, to be provided; the bacteriological count of the milk not to exceed 100,000 bacteria per cubic centimeter, at the time the milk reaches the city, at any season of the year, as determined by the Health Department at frequent intervals; milk to be delivered to the customer in sterilized containers to be filled upon the dairy farm, and the temperature of the milk not to exceed 50° F. until delivered to the consumer.

Approved for publication:

JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., *May 28, 1907.*

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